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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,528	08/29/2001	Philipp Lang	3155/102	6548

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BROMBERG & SUNSTEIN LLP  
125 SUMMER STREET  
BOSTON, MA 02110-1618

EXAMINER
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LU, TOM Y

ART UNIT	PAPER NUMBER
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2624

MAIL DATE	DELIVERY MODE
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08/08/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/942,528	<b>Applicant(s)</b> LANG, PHILIPP	
	<b>Examiner</b> Tom Y. Lu	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 8-10, 12-31 and 48-55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-10, 12-31 and 48-55 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment and written response filed 05/21/2007 has been entered and considered.
2. Claims 1, 3 and 8 have been amended.
3. Claims 1-4, 8-10, 12-31 and 48-55 are pending.

### ***Response to Arguments***

4. Applicant's arguments filed 05/21/2007 have been fully considered but they are not persuasive.

The Jiang reference:

Applicant argues the Jiang reference fails to teach quantitative information, which is selected from the group consisting of trabecular thickness and two-dimensional or three-dimensional spaces between trabeculae. Applicant also argues Jiang does not disclose all the acquisition parameters recited in claim 17. Furthermore, applicant argues Jiang does not teach one or more internal standards. Moreover, applicant argues Jiang does not generate a diagnostic report based on the quantitative information.

Upon further review of specification and in light of applicant's arguments, the examiner respectfully disagrees as follows: The examiner notes Jiang teaches trabecular thickness at column 6, line 18, bone mineral densitometry, BMD, and the two-dimensional or three-dimensional spaces between trabeculae by determining Minkowski dimension, and In fractal geometry, the Minkowski-Bouligand dimension or Minkowski dimension is a way of determining the fractal dimension of a set  $S$  in a Euclidean space  $R^n$ , or more generally of a metric space  $(X,d)$ . This dimension is also known as the packing dimension or, less accurately,

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the box-counting dimension. And the boxes are the claimed “two-dimensional or three-dimensional spaces.” The examiner further notes the claim calls for selecting information from the group consisting of trabecular thickness, or two-dimensional or three-dimensional spaces between trabeculae, which means only one of three is addressed in Jiang is enough to meet the claim limitation. With regard to “acquisition parameters”, Jiang teaches spatial resolution at column 9, lines 20-28, focal spot at column 8, line 12, film distance at column 8, line 13. Since the claim does not require all the parameters to be selected two parameters are enough to meet the claim limitation. With regard to “internal standards”, Jiang teaches BMD as internal standards, such as standard pelvis thickness, column 7, line 55-56. With regard to “diagnostic report”, the examiner notes after a specimen was scanned, and a region of interest was identified, the area BMD within the ROI was obtained and analyzed (column 7, lines 49-65), and the analysis report is generated to compare with the standards in table 1 at column 10.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 8-10, 12-31 and 48-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al (“Jiang” hereafter) (U.S. Patent No. 6,442,287 B1) in view of Wheeler et al (“Wheeler” hereafter) (U.S. Patent No. 5,200,993)

- a. As per claim 1, Jiang teaches a method to derive quantitative information (column 3, lines 62-65) from an x-ray image (column 3, line 12) comprising: providing a

digitized x-ray image on a local computer (figure 1, steps S10 and S20), wherein the x-ray image includes an image of bone (column 6, lines 27-37); analyzing the x-ray image at a computer, thereby deriving quantitative information on trabecular bone structure from the x-ray image (column 6, lines 38-44; steps S30-S70), wherein said information is selected from the group consisting of trabecular thickness and two-dimensional or three-dimensional spaces between trabeculae (see explanation in paragraph 4 above). Jiang does not explicitly teach the computer is a remote computer in a network environment. Wheeler teaches a host computer 16 and the workstations 12, 14 and 22 are connected in a network environment for sharing of the medical images (see figure 1 and column 4, lines 38-52). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to adapt Wheeler's networking system in Jiang to retrieve medical image data from a host computer and perform image processing at the desired remote computer. One would be motivated to do so because such networking environment increases data handling flexibility and resources while avoiding the requirement for user acquisition of expensive equipment, which may not be compatible with other users as suggested by Wheeler at column 10, lines 2-6.

- b. As per claim 2, the combination of Jiang and Wheeler teaches wherein the analysis of the x-ray image comprises using a computer program on the remote computer (both Jiang and Wheeler teaches use of computer program for image analysis; e.g. column 6, line 6-7 in Jiang).

- c. As per claim 3, the combination of Jiang and Wheeler teaches wherein said quantitative information includes densitometric information (see step S41 in Jiang).
- d. As per claim 4, the combination of Jiang and Wheeler teaches wherein said densitometric information is bone mineral density (see step S41 in Jiang).
- e. As per claim 8, the combination of Jiang and Wheeler teaches wherein said quantitative information includes information on the morphology of the bone (Jiang: column 3, lines 62-65).
- f. As per claim 9, the combination of Jiang and Wheeler teaches wherein said information on the morphology of a structure is information on the two-dimensional arrangement of individual components forming said structure (Jiang: column 17, lines 21-31).
- g. As per claim 10, the combination of Jiang and Wheeler teaches wherein said information on the morphology of a structure is information on the three-dimensional arrangement of individual components forming said structure (Jiang: column 17, lines 21-31).
- h. As per claim 12, the combination of Jiang and Wheeler teaches wherein said information includes two dimensional or three dimensional architecture of the trabecular network (Jiang: column 17, lines 21-31).
- i. As per claim 13, the combination of Jiang and Wheeler teaches transmitting x-ray acquisition parameters to the remote computer (Jiang: the combination of Jiang and Wheeler teaches the image process is done on a remote computer, and the

image process requires the size of ROI and the spatial resolution, column 9, lines 20-28).

- j. As per claim 14, whether the acquisition parameters transmitted prior to the remote computer prior to, simultaneously or after the x-ray image does not affect the image process, thus it carries no patentable weights. In addition, the applicant does not state transmitting the parameters prior to, simultaneously or after the x-ray image would post any significant advantage or solve any particular problem. Therefore, the examiner herein takes official notice that the combination of Jiang and Wheeler can transmit the parameters prior to, simultaneously or after the x-ray image
- k. As per claim 15, see explanation in claim 14.
- l. As per claim 16, see explanation in claim 14.
- m. As per claim 17, see explanation in paragraph 4 above
- n. As per claim 18, the combination of Jiang and Wheeler teaches wherein the X-ray image further comprises one or more internal standards (see explanation in paragraph 4 above).
- o. As per claim 19, the combination of Jiang and Wheeler teaches wherein the internal standard is density of tissue of a human or air surrounding a structure (BMD is bone density).
- p. As per claim 20, the combination of Jiang and Wheeler teaches wherein the internal standard is density of a tissue and the tissue is selected from the group consisting of subcutaneous, fat, bone and muscle (bone is the selected tissue).

- q. As per claim 21, the combination of Jiang and Wheeler teaches wherein the information is encrypted prior to transmission (Wheeler: column 7, lines 30-31).
- r. As per claim 22, the combination of Jiang and Wheeler teaches generating a diagnostic report based on the quantitative information (see explanation in paragraph 4 above).
- s. As per claim 23, the combination of Jiang and Wheeler teaches wherein said diagnostic report provides information on a patient's state of health (tables 1-3 provides information about a patient's bone strength based on the BMD measurements).
- t. As per claim 24, the combination of Jiang and Wheeler teaches wherein the state of health is selected from the group consisting of bone mineral density status and fracture risk (see explanation in claim 23).
- u. As per claim 25, the examiner notes the invention of Jiang shows the relationship between the bone strength and BMD, and by comparing an individual's BMD with the models derived in tables 1-3, the patient's health status is clear. Although Jiang does not explicitly teach generating a bill for determining a patient's bone health, it would have been obvious to a person of ordinary skill in the art that such practice can be integrated to Jiang's system if it is desired. The examiner takes official notice herein.
- v. As per claim 26, see explanation in claim 25.



- w. As per claim 27, the combination of Jiang and Wheeler teaches wherein the x-ray image is an x-ray film (Jiang: the x-ray image is a digitized x-ray film image, column 6, lines 45-47).
- x. As per claim 28, see explanation in claim 27.
- y. As per claim 29, the combination of Jiang and Wheeler teaches wherein the film is digitized using a scanning unit (see figure 3A in Jiang).
- z. As per claim 30, the combination of Jiang and Wheeler teaches wherein said x-ray film image is acquired digitally (the x-ray image in Jiang is acquired digitally through digitization circuit 2000a, column 6, lines 45-47).
- aa. As per claim 31, the combination of Jiang and Wheeler does not explicitly teach the acquisition system is a selenium detector system or a silicon detector system. The examiner takes official notice that either system is suitable for Jiang's system because the kind of acquisition system is irrelevant in Jiang since the novelty of the invention about performing measurements on the output of the acquisition system, a digital image.
- bb. As per claim 48, the combination of Jiang and Wheeler teaches analyzing an x-ray image for osteoporosis (see figure 2A)
- cc. As per claim 49, the examiner notes the combination of Jiang and Wheeler does not explicitly teach providing suitable treatment for a patient's diagnosis. The examiner notes any qualified physician is capable of providing a treatment to the patient once the result of the bone analysis is produced by Jiang's system. An official notice is taken here.

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- dd. As per claim 50, see explanation in claim 49.
- ee. As per claim 51, see explanation in claims 8 and 9 above.
- ff. As per claim 52, see explanation in claim 3 above.
- gg. As per claim 53, see explanation in claim 48.
- hh. As per claim 54, see explanation in claim 49.
- ii. As per claim 55, see explanation in claim 50.

***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

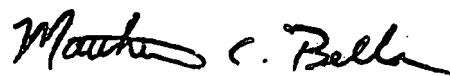
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y. Lu whose telephone number is (571) 272-7393. The examiner can normally be reached on 8:30AM-5PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571)-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TYL

A handwritten signature in black ink that reads "Matthew C. Bella". The signature is fluid and cursive, with the first name "Matthew" being more prominent than the last name "Bella".

MATTHEW C. BELLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600